

Application Number 10/670,944
Response to Office Action mailed January 10, 2008

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REMARKS

Applicant has amended claims 1, 2, 3, 5, 13 and 28. The following remarks are responsive to the Office Action dated January 10, 2008. Claims 1-16 and 21-40 are pending.

Claim Rejection Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 1-16 and 21-40, under 35 U.S.C. 103(a) as being unpatentable over Kojima et al. (US 2003/0179705) in view of Kaniz et al. (US 6,990,102). Applicant traverses the rejection. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention.

With reference to independent claim 1, for example, the applied references lack any teaching that would have suggested a method comprising calculating traffic statistics associated with packet flows through a network, storing the traffic statistics within a flow table, and maintaining a heap that provides a heap-ordered representation of at least a portion of the traffic statistics of the packet flows within the flow table. The applied references also fail to teach or suggest that the heap is a tree having a root node and a plurality of other nodes arranged as parent nodes and child nodes, each of the nodes storing traffic statistics for a different one of the packet flows, wherein the tree is heap-ordered in that a value for the traffic statistics stored in any child node of the tree is less than or equal to a value for the traffic statistics stored within that child node's parent node within the tree, as further required by claim 1.

Instead, Kojima teaches to a system that includes circuit interface units, where each of the circuit interface units includes input and output counters.¹ The input and output counters maintain a count of the traffic that is input and output from a circuit corresponding to each circuit interface unit.² Counters to count input and output traffic, however, are substantially different from a heap-ordered representation of the packet flows, as required by claim 1. Applicant therefore agrees with the Examiner's characterization of Kojima when the Examiner states that Kojima is "silent in teaches[sic] providing a heap-ordered representation."

¹ Abstract; Fig. 1.

² Abstract.

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The Examiner then turns to Kaniz to cure the deficiency noted above with respect to Kojima and improperly characterizes Kaniz as disclosing a heap-ordered representation of packet flows, as required by Applicants' claim 1, for example. In fact, Kaniz lacks any teaching to suggest a heap-ordered representation. Instead, Kaniz teaches to an address lookup table in a multiport switch.³ The multiport switch stores the address lookup table to two sub-tables 601, 602, each table having "bin entries" and "heap entries."⁴ The multiport switch uses the address lookup table for source address and destination address checking.⁵

The Kaniz reference continues by describing in detail how table entries are stored to sub-tables 601, 602. The Kaniz multiport switch determines in which row of either one of sub-tables 601, 602 to place each table entry based on a hash using either the source or destination address included within a received frame.⁶ But, as Kaniz explains, use of the hash may result in a collision.⁷ That is, "because the possibly output range of hash values is less than the range of possible hash input values, multiple input values may produce the same output hash value."⁸ When a collision occurs, the value that was to be stored in the bin entry at which there is a collision is stored instead in the next open heap entry.⁹ Also, a next pointer field of the bin entry at which there is the collision is set to point to the heap entry.¹⁰ Kaniz notes that "multiple colliding entries in tables 601 or 602 may be 'chained' together through the next pointer field," thereby defining a "linked list of entries."¹¹

However, the Examiner nevertheless characterizes Kaniz as describing a heap-ordered representation and cites Fig. 6, heap entries 604; column 9, lines 59-67; and column 10, lines 1-19. But as described above, Kaniz refers to the chained tables as a linked list of entries, but there is no teaching or suggestion that the entries are "heap-ordered," let alone heap-ordered representation of packet flows.

³ Abstract.

⁴ Fig. 6; column 8, lines 30-38.

⁵ Column 8, lines 60-61.

⁶ Column 9, lines 13-17.

⁷ Column 9, lines 27-30.

⁸ *Id.*

⁹ Column 9, lines 31-35.

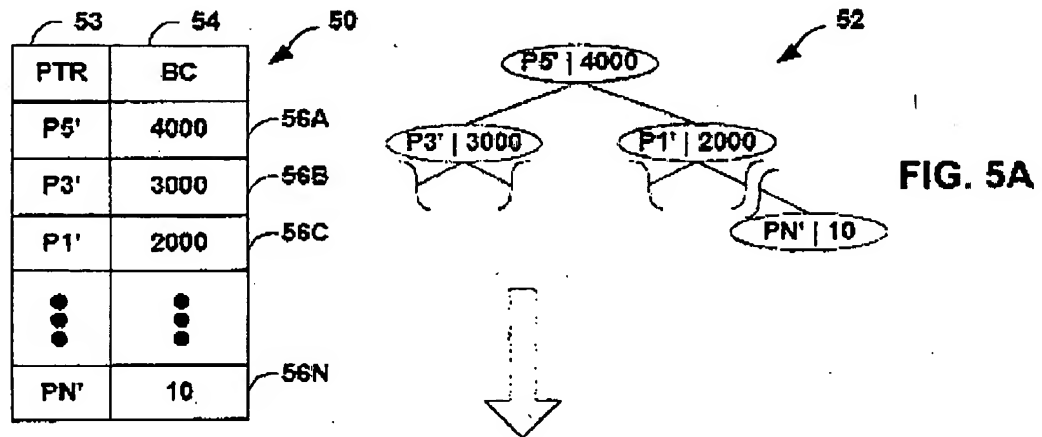
¹⁰ Column 9, lines 31-35.

¹¹ Column 9, lines 35-

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Applicant's claim 1 requires that the heap-ordered representation of the statistics for packet flows comprises a tree having a root node and a plurality of other nodes arranged as parent nodes and child nodes, each of the nodes storing traffic statistics for a different one of the packet flows, and wherein the tree is heap-ordered in that a value for the traffic statistics stored in any child node of the tree is less than or equal to a value for the traffic statistics stored within that child node's parent node within the tree. As one example, Applicants direct the Examiner to the following reproduced portion of Applicant's FIG. 5A that shows flow table 50 and a heap-ordered representation 52 organized as a tree in which the traffic statistics stored in each child node are less than traffic statistics for the parent nodes:



Comparing the above reproduced portion of FIG. 5A with Fig. 8 of Kaniz readily distinguishes a heap-order representation from the Kaniz linked list of entries. Fig. 8 of Kaniz illustrates no discernable ordering among the link list of entries 800a, 810a-810c. Kaniz further makes no mention of ordering the table entries, much less ordering the table entries according to a heap-ordered representation. In fact, Kaniz does not even mention that the value of an entry is referenced when adding entries to the linked list of entries.

Applicant, therefore, submits that Kaniz uses the term "heap" at column 10 lines 14-15; "heap entries" at column 8 lines 33, 38; and "heap portion" at column 12 lines 44, 46 merely as a means of distinguishing that type of address table entry from "bin entries." The terms are unrelated to the heap-ordered representation of packet flows as set forth in claim 1. Kaniz apparently uses the word "heap" to represent what in effect is a hash overflow or collision table,

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not what may be construed as a heap let alone a heap that provides a heap-ordered representation of the packet flows, as required by claim 1.

The Examiner therefore has improperly construed Kaniz as disclosing a heap-ordered representation when in fact Kaniz merely uses the word "heap" in an attempt to represent a hash overflow or collision table capable of storing a linked list of entries. As a result, Kaniz does not cure the deficiencies of Kojima, as suggested by the Examiner. Because neither Kojima nor Kaniz disclose this heap-ordered limitation as set forth in Applicant's independent claim 1, Applicants requests prompt withdrawal of the rejection.

While the above arguments were made above with respect to claim 1, each of Applicants' independent claims 13, 21, 28 and 39 set forth a substantially similar heap-ordered limitation to that of claim 1. As a result, each of independent claims 13, 21, 28 and 39 benefit from the above arguments made with respect to claim 1, and Applicants request prompt withdrawal of the rejection for similar reasons. Additionally, those claims 1-16 and 21-40 that depend on independent claims 1, 13, 21, 28 and 39 also benefit from the above arguments made with respect to claim 1, and Applicant also requests withdrawal of the rejection set forth against these dependent claims.

For at least these reasons, the Examiner has failed to establish a prima facie case for non-patentability of Applicant's claims 1-16 and 21-40 under 35 U.S.C. 103(a). Withdrawal of this rejection is requested.

CONCLUSION

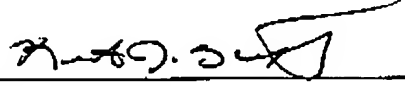
All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date:

By:

April 10, 2008

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